LISTING OF THE CLAIMS

1. (original) A method of testing multiple compositions for their ability to modulate cytoskeletal function, said method comprising:

i. adhering a first cytoskeletal component to a solid support;

ii. contacting said first component with a second cytoskeletal component having an affinity for said first cytoskeletal component in a reaction mixture;

iii. further contacting the reaction mixture with multiple test compositions to determine their ability to modulate the binding affinity of the first and second cytoskeletal components; and

iv. detecting changes in the binding affinity of the second cytoskeletal component to the first cytoskeletal component at a control concentration and a test concentration of said test compositions; wherein said detecting does not involve detecting the active movement of the cytoskeletal components.

2. (original) The method of claim 1, wherein the first cytoskeletal component is indirectly adhered to the solid support.

3. (original) The method of claim 1, wherein the cytoskeletal component is adhered to the solid support in an oriented fashion.

4. (original) The method of claim 2, wherein the first cytoskeletal component is indirectly adhered to the solid support by binding to an inactivated molecular motor which is bound to the support.

5. (original) The method of claim 1, wherein the first and second components are contacted in the presence of a cell lysate.

6. (original) The method of claim 1, wherein the reaction mixtures are in multiple arrays on a single integrated support.

7. (original) The method of claim 1, wherein the second component is tagged with a reporter molecule.

8. (original) The method of claim 7, wherein the reporter molecule is a fluorophore.

9. (original) The method of claim 8, wherein the fluorophore is GFP.

10. (original) The method of claim 9, wherein the method of detection is total internal reflection microscopy.

11. (original) The method of claim 1, wherein one of the cytoskeletal components is a cytoskeletal polymer.

12. (original) The method of claim 1, wherein one of the cytoskeletal components is a monomer of a cytoskeletal polymer.

13. (original) The method of claim 1, wherein one of the cytoskeletal components is a molecular motor.

14. (original) The method of claim 1, wherein the signal to noise ratio is at least about 2-fold over negative controls.

15. (original) The method of claim 1, wherein the density of the first cytoskeletal component on the solid support is at least 2 polymers/50 μ^2.

16. (original) The method of claim 1, wherein the concentration of the first cytoskeletal component is at least 10ng/μ^2.

17. (original) The method of claim 1, wherein the throughput is at least about one sample/min.

18. (original) A high throughput method for testing multiple compositions for their ability to modulate cytoskeletal function, said method comprising:

i. adhering a first cytoskeletal component to a solid support, wherein said first cytoskeletal component is spatially arranged to form distinct arrays on said solid support; and

ii. for each array, simultaneously detecting the binding of a second cytoskeletal component to the first cytoskeletal component, in the presence or absence of a test composition.

19. (original) A method of identifying a therapeutic lead compound that modulates activity of a cytoskeletal system, said method comprising:

i) providing an assay mixture comprising a first component of a cytoskeletal system and a second component of a cytoskeletal system, wherein said first component and said second component specifically bind to each other;

ii) contacting said assay mixture with a test compound to be screened for the ability to modulate binding between said first component and said second component;

iii) detecting a difference in the binding specificity or avidity of said first component to said second component, at a test concentration and a control concentration of said compound to be screened, wherein said detecting does not involve detecting active movement of a component of said cytoskeletal system, and wherein said difference in the binding specificity or avidditiy of said first component to said second component identifies a compound that modulates activity of a cytoskeletal system.

20. (original) The method of claim 19, wherein said first and second components are selected from the group consisting of cytoskeletal polymers, motor proteins and cytoskeletal polymer binding proteins.

21. (original) The method of claim 19, wherein said first and second components are components of a microtubule system.

22. (original) The method of claim 19, wherein said first and second components are components of an actin/myosin system.

23. (original) The method of claim 19, wherein said first and second components are components of an intermediate filament system.

24. (original) The method of claim 19, wherein said first and second components are selected from the group consisting of a binding pair selected from Table 1.

25. (original) The method of claim 19, wherein said reaction mixture comprises a cell lysate.

26. (original) The method of claim 19, further comprising the step of entering the identity of a test compound that has a significant effect on binding of said first component to said second component into a database of therapeutic lead compounds.

27. (original) The method of claim 26, wherein said test compound causes at least a 10% change in binding affinity between said first and said second component in order to be entered into said database.

28. (original) The method of claim 26, further comprising: contacting a cell with a test compound whose identity is entered in said database; and detecting inhibition in the growth or proliferation of said cell.

29. (original) The method of claim 19, wherein said first component is labeled with a label.

30. (original) The method of claim 29, wherein said label is a fluorescent label.

31. (original) The method of claim 30, wherein said detection is by an optical method.

32. (original) The method of claim 19, wherein said control concentration is the absence of said compound to be screened.

33. (original) The method of claim 19, wherein at least 50 test compounds are screened simultaneously.

34. (original) The method of claim 19, wherein at least two different first component and second component pairs are tested simultaneously.

35. (original) The method of claim 33, wherein said test compounds are members of a combinatorial library.

36. (original) The method of claim 19, wherein said first component or said second component is attached to a solid support.

37. (original) A method of identifying a therapeutic lead compound that modulates activity of a cytoskeletal system, said method comprising:

i) providing an assay mixture comprising a first component of a cytoskeletal system and a second component of a cytoskeletal system, wherein said first component and said second component specifically bind to each other;

ii) contacting said assay mixture with a test compound to be screened for the ability to inhibit or enhance binding between said first component and said second component;

iii) detecting a change in coupling between ATP hydrolysis and force generation; wherein said change indicates that said compound modulates activity of a cytoskeletal system.

38. (original) The method of claim 37, wherein said first and second components are selected from the group consisting of cytoskeletal polymers, motor proteins and cytoskeletal polymer binding proteins.

39. (original) The method of claim 37, wherein said first and second components are components of a microtubule system.

40. (original) The method of claim 37, wherein said first and second components are components of an actin/myosin system.

41. (original) A method of identifying the presence of a compound that modulates activity of a cytoskeletal system, said method comprising:

i) providing a first assay mixture comprising a first component of a cytoskeletal system and a second component of a [microtubule] cytoskeletal system, wherein said first component and said second component specifically bind to each other;

ii) contacting said assay mixture with a first test compound to be screened for the ability to modulate binding between said first component and said second component;

iii) detecting a difference in the binding specificity or avidity of said first component to said second component, at a test concentration and a control concentration of said compound to be screened, wherein [said detecting does not involve detecting active movement of a component of said cytoskeletal system and wherein said difference is due to a specific interaction between said test compound and said first or said second component] detecting a difference in said binding specificity or avidity identifies the presence of a compound that modulates activity of a cytoskeletal system.

42. (original) The method of claim 41, wherein said first and second components are selected from the group consisting of cytoskeletal polymers, motor proteins and cytoskeletal polymer binding proteins.

43. (original) The method of claim 41, wherein said assay mixture comprises a cell lysate.

44. (original) The method of claim 41, wherein at least one of said first or second components is labeled with a label.

45. (original) The method of claim 44, wherein said label is a fluorescent label.

46. (original) The method of claim 45, wherein said fluorescent label is a fluorescent protein.

47. (original) The method of claim 44, wherein said component and said label are provided as a fusion protein.

48. (original) The method of claim 41, wherein said detection is by an optical method.

49. (original) The method of claim 48, wherein said optical method is microscopy.

50. (original) The method of claim 49, wherein said microscopy is confocal microscopy.

51. (original) The method of claim 50, wherein said microscopy is total internal reflection microscopy.

52. (original) The method of claim 41, wherein said method of detection is by an ATPase assay.

53. (original) The method of claim 41, wherein said method of detection is by a two hybrid system.

54. (original) The method of claim 41, wherein said difference is 10% or greater than said binding specificity or avidity of said test concentration.

55. (original) The method of claim 41, wherein said control concentration is the absence of said compound to be screened.

56. (original) The method of claim 41 further comprising providing at least a second assay mixture in accordance with step i of claim 1, and providing at least a second test compound which can be the same or different from said first test compound and repeating steps ii and iii of claim 1 on said second assay mixture.

57. (original) The method of claim 41, wherein said first test compound is a member of a combinatorial library.

58. (original) The method of claim 41, wherein said first test compound is a member of a synthetic or natural products library.

59. (original) The method of claim 41, wherein said first test compound is a small molecule.

60. (original) The method of claim 59, wherein said molecule is less than 4 kilodaltons.

61. (original) The method of claim 41, wherein said first compound which is identified is a lead therapeutic for animal or human disease.

62. (original) The method of claim 41, wherein said first compound which is identified is a lead bioagricultural compound.

63. (original) The method of claim 62, wherein said first compound is a lead compound as an herbicide, pesticide or fungicide.

64. (original) The method of claim 41, wherein said compound which is identified is a lead diagnostic.

65. (original) The method of claim 41, wherein at least one of said first component or said second component is attached to a solid support.

66. (original) The method of claim 41, wherein said detecting does not involve detecting active movement of a component of said cytoskeletal system.

67. (original) The method of claim 41, wherein said test compound is not a compound selected from the group consisting of an antibody, a nucleotide, and a nucleotide analogue.

68. (original) The method of claim 41, wherein the specific binding of said first and second components is not polymerization of a cytoskeletal element.

69. (original) The method of claim 41, wherein the specific binding of said first and second components is not an interaction selected from the group consisting of tubulin polymerization, actin polymerization, and tau-tau interaction.